[0040] Note further that in at least one embodiment of the invention the user input detected by the system **10** may be used to control imagery being projected on the translucent screen **12**.

[0041] Note further that in at least one embodiment of the invention the user input detected by the system **10** can be used by the data processor **20** to recognize specific body parts, such as fingers or hands, or prosthetics.

[0042] The apparatus and methods in accordance with embodiments of this invention have a number of advantages over conventional techniques. For example, embodiments in accordance with this invention use images taken by the camera **14** positioned on the opposite side of the screen **12** in relation to the user. Therefore, this invention can be used in store fronts and similar situations where it is desired to protect the system hardware, such as the camera **14**, from environmental influences. The apparatus and methods in accordance with embodiments of this invention also allow for multiple and simultaneous inputs from one or more users, unlike the conventional methods and systems based on sound, laser, Doppler radar and LED arrays.

[0043] Further, the apparatus and methods in accordance with embodiments of this invention do not require IR filters or special lighting. Thus, a less complex and less expensive user input system is enabled, and the system can be used those situations where the screen **12** is exposed to significant amounts of infrared light, such as when a store front is exposed to direct sun light.

What is claimed is:

1. An information input apparatus comprising:

a translucent screen;

an image capture device located for imaging a first side of the screen opposite a second side where user interaction occurs; and

an image processor coupled to the output of the image capture device to determine at least one of where and when a person touches an area on the second side of the screen by a change in intensity of light emanating from the touched area relative to a surrounding area.

2. An information input apparatus as in claim 1, where the image processor uses an image differencing technique.

3. An information input apparatus as in claim 1, where the image processor uses a background subtraction technique.

4. An information input apparatus as in claim 1, further comprising at least one light source located for illuminating the first side of the screen.

5. An information input apparatus as in claim 4, further comprising at least one light source located for illuminating the second side of the screen.

6. An information input apparatus as in claim 1, where when incident light on the second side of the screen is brighter than incident light on the first side of the screen, an image of the point of contact with the screen is silhouetted and appears darker than the surrounding area, while when incident light on the first side of the screen is brighter than incident light on the second side of the screen, an image of the point of contact with the screen is highlighted and appears brighter than the surrounding area.

7. An information input apparatus as in claim 6, where said image processor detects a location of the point of contact by comparing a first image of the first side of the screen with a second image of the first side of the screen.

8. An information input apparatus as in claim 6, where said image processor detects a time of the contact by comparing a first image of the first side of the screen with a second image of the first side of the screen.

9. An information input apparatus as in claim 1, where there are a plurality of screens serviced by a single camera one of sequentially or simultaneously.

10. An information input apparatus as in claim 1, where the screen is arranged to display projected imagery generated by an imaging device.

11. A method to detect a user input, comprising providing a system having a translucent screen having an image capture device located for imaging a first side of the screen opposite a second side where user interaction occurs; the method determining at least one of where and when a person touches an area on the second side of the screen by detecting a change in intensity of light emanating from the touched area relative to a surrounding area.

12. A method as in claim 11, where detecting uses an image differencing technique.

13. A method as in claim 11, where detecting uses a background subtraction technique.

14. A method as in claim 11, further comprising providing at least one light source located for illuminating the first side of the screen.

15. A method as in claim 14, further comprising providing at least one additional light source located for illuminating the second side of the screen.

16. A method as in claim 11, where when incident light on the second side of the screen is brighter than incident light on the first side of the screen, detecting detects that an image of the point of contact with the screen is silhouetted and appears darker than the surrounding area, while when incident light on the first side of the screen is brighter than incident light on the second side of the screen, detecting detects that an image of the point of contact with the screen is highlighted and appears brighter than the surrounding area.

17. A method as in claim 16, where detecting detects a location of the point of contact by comparing a first image of the first side of the screen with a second image of the first side of the screen.

18. A method as in claim 16, where detecting detects a time of the contact by comparing a first image of the first side of the screen with a second image of the first side of the screen.

19. A method as in claim 11, where there are a plurality of screens provided and serviced by a single camera sequentially or simultaneously.

20. A method as in claim 11, further comprising displaying projected imagery generated by an imaging device on the screen.

21. A method as in claim 11, further comprising detecting a difference between incident light on the second side of the screen and incident light on the first side of the screen, and using the detected difference to control the brightness of at least one light source.

22. A signal bearing medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform operations to detect a user input, the operations comprising, in response to providing a system having a translucent screen having an image